

REMARKS

Claims 28-30 have been amended for clarification purposes. Claims 28-31 are pending in this application. Applicants reserve the right to pursue the original claims and other claims in this and other applications.

Claims 28-31 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims have been amended to address the concerns raised in the Office Action. Applicants respectfully request that the rejection of these claims be withdrawn.

Claims 28-31 are rejected under 35 USC § 103(a) as being unpatentable over Forsythe et al. (U.S. Patent No. 4,214,993) ("Forsythe"), Sauer et al. (EP 0969090) ("Sauer") and Hansen et al. (U.S. Patent No. 6,672,458) ("Hansen"). This rejection is respectfully traversed.

The Office states that Forsythe relates to a method for separating fluids, but does not disclose the purification of nucleic acids. The Office also indicates that Forsythe discloses that if desired, a pump (suction or pressure) may be used to move the fluid through the column. Applicants respectfully submit, however, that Forsythe does not disclose "introducing air into the tip after discharging the washing solution so that remaining liquid within the solid phase is discharged from the tip," as recited in claim 28.

Applicants respectfully submit that the "introducing air into the tip" step, as recited in claim 28, is an important aspect of the claimed invention as it can be used to remove remaining washing solution from the solid phase. During the sucking/discharging method, washing solution tends to remain within the solid phase

used therein. The remaining washing solution problem occurs in the use of a solid phase with a low flow-through resistance in a sucking method, which allows the nucleic acid containing sample to easily flow through the solid phase. The remaining washing solution in the solid phase can have a negative impact on the performance of a nucleic acid analysis. Therefore, the "introducing air into the tip" step is an important aspect of the invention that can be used to remove the remaining washing solution.

Moreover, Forsythe does not disclose or suggest the use of a pump to remove remaining liquid within a solid phase from a tip. Instead, Forsythe uses a centrifugal separation method in which the solid phase to be used should have a high flow-through resistance that minimizes the leakage of the sample liquid while setting the column on the centrifuge. Furthermore, the sample liquid on or within the solid phase directly receives the centrifugal force.

In the Forsythe system, a washing fluid is supplied to a resin bed in a separating column and then collected in a first cup. (Forsythe, col. 2, lines 26-35). At this stage, the washing fluid removes un-adsorbed components in the sample from the resin bed. (Forsythe, col. 2, lines 57-58). In a successive stage, residual washing fluid is transferred to the first cup by the centrifugal force given by increasing the revolution speed. (Forsythe, col. 2, lines 58-60).

Based upon Forsythe's centrifugal separation method, only small traces of sample liquid will likely remain on or within the solid phase. As such, Forsythe does not produce the problem of washing solution remaining within a solid phase from a sucking/discharging method. As a result, Forsythe's method for separating fluids does not necessitate introducing air into the tip after discharging the washing solution so that remaining liquid within the solid phase is discharged from the tip. Accordingly, Forsythe does not disclose or suggest every limitation as recited in claim 28.

Furthermore, Forsythe does not disclose the “introducing a washing solution” step as recited in claim 28. The Office Action relies on Sauer for disclosing this limitation. Sauer discloses applying a sample to a spin column, washing the spin column, and then centrifuging for one minute to remove residual washing buffer. (Sauer, col. 10, lines 1-44). As in Forsythe, Sauer’s centrifugal separation method produces only small traces of sample liquid remaining on or within the solid phase. As such, Sauer does not produce the problem of remaining washing solution within a solid phase which necessitates introducing air into the tip. Accordingly, a person of ordinary skill would not have been motivated to combine Forsythe and Sauer to produce the invention of claim 28.

Moreover, neither Forsythe nor Sauer disclose or suggest the “sucking and discharging” method recited in claim 28. The Office Action relies on Hansen for disclosing this method; however, Applicants respectfully submit that Hansen also fails to disclose or suggest the “sucking and discharging” method as recited in claim 28.

Applicants respectfully submit that Hansen defines a method of recovering nucleic acid by magnetic force. The method includes magnetic beads as a solid phase that contains a nucleic acid capturing agent. Hansen’s method of separating fluids includes introducing a washing solution into a tube 120, applying AC magnetic field thereto to mix with a magnetically-responsive particles 190, and removing from the tube 120 using a pipette tip, and this process is required to be repeated twice. (Hansen, col. 6, lines 42-67).

Applicants respectfully note that Hansen discloses that the solid phase is incorporated in a tube and not in a tip, as recited in claim 28. The pipette tip in Hansen, which relies on Robot 104, is a dispensing tip of a ordinary type and not a specific tip that incorporates solid phase containing nucleic acid capturing agent, as recited in


claim 28. (Hansen, col. 6, lines 61-65). Hansen discloses that the pipette tip performs sucking and discharging actions to mix and agitate the magnetic beads and a sample liquid containing nucleic acid in the tube. (Hansen, col. 6, lines 42-67). During this mixing process by the pipette tip, the magnetic beads are not transferred to the pipette tip, they remain in the tube. (Hansen, col. 6, lines 42-67). Applicants respectfully submit that the pipette tip in Hansen does not include said tip being provided with a solution-path at its top of said tip which allows a nucleic acid containing solution to be sucked and discharged therethrough for extraction of nucleic acid, as recited in claim 28. Therefore, the problem of remaining washing solution within the solid phase cannot arise in the Hansen's pipette tip. As such, Hansen does not disclose or suggest the sucking and discharging method recited in claim 28.

Applicants respectfully submit that a person of ordinary skill would not have been motivated to combine Forsythe, Sauer, and Hansen to arrive at the subject matter of claim 28. Applicants further submit that neither Forsythe, Sauer, nor Hansen disclose or suggest a sucking/discharging method. Moreover, none of the cited references disclose or suggest purging the remaining washing solution by introducing air into the tip after discharging the washing solution. Accordingly, Forsythe, Sauer, and Hansen, whether considered alone or in combination, do not disclose or suggest every limitation of claim 28. Claims 29-31 depend from claim 28. Applicants respectfully request the withdrawal of the § 103(a) rejection and the allowance of claims 28-31.

In view of the above amendment, Applicants believe that the pending application is in condition for allowance.

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